Exercises 2

1) What is the difference between memory-mapped and isolated I/O? (see lecture)
2) Assume

c1=5;
c2=6;
What bit pattern do the following variables get?
c9=~c1;
c10=c1<<3;
c11=c1<<6;
c12=c1>>2
c13=c1&c2
c14=c1|

3) Assume you have a register with 8 bits that you can either write or read. The access is via ADDR, e.g. #define ADDR 0x08

How would you:
set one specific bit in this register?
clear one specific bit in this register?
flip one specific bit in this register?
Clear the whole register?
Set all values of the whole register?
Flip all bits in the register?

4) Bitrate is defined as b = bits/second
Baudrate is defined as s = number of symbols / second

How can you translate between bitrate and baudrate?

Using this formula what is the baudrate of a system where each transmission is 2 symbols and the bitrate is 1000 Mb/s?

What is the bitrate of a system having 4 symbols per transmission and a baudrate of 10 million symbols per second?

Solutions
1) See lecture slides
2)
c1=5;   /* c1 har bitmönstret 00000101 */
c2=6;   /* c2 har bitmönstret 00000110 */

c9=~c1;   /* c9 får bitmönstret 11111010 */
c10=c1<<3;   /* c10 får bitmönstret 00101000 */
c11=c1<<6;   /* c11 får bitmönstret 01000000 */
c12=c1>>2   /* c12 får bitmönstret 00000001 */
c13=c1&c2   /* c13 får bitmönstret 00000100 */
c14=c1|c2 /* c14 får bitmönstret 00000111 */
3) In the following BIT identifies which bit to change, so if we want the 5th to change, BIT=5

*ADDR |= (1<<BIT)
*ADDR &= ~(1<<BIT)
*ADDR ^= (1<<BIT)

*ADDR &= 0x00
*ADDR |= 0xFF
*ADDR = ~ADDR

4)   b = s * n   s = b/n   s = 1000 MB/s / 2 = 500 Baud
b = s *n   b = 10 M symbols / s * 4 = 40 MB/s